ABSTRACT

Bioethanol is a type of alcohol produced from glucose fermentation, followed by distillation process. Raw materials from bioethanol are divided into three groups, namely glucose, starch or carbohydrate and lignocellulose. Oil Palm Empty Fruit Bunch (OPEFB) is a waste of palm oil products that are no longer used and has cellulose, hemicellulose and lignin content of 37.3 - 46.5%, 25.3 - 33.8% and 27.6 - 32.5%. Conversion of lignocellulose OPEFB into bioethanol is required pretreatment process which generally serves to reduce or eliminate various materials / compounds that can inhibit the rate of hydrolysis and increase the production of bioethanol from simple sugars derived from cellulose and hemicellulose. Pretreatment method is physically done because it is environmentally friendly, does not use chemicals and does not produce harmful residues. The pretreatment method uses ultrasonic techniques to make the resulting substrate easier to hydrolyze by increasing the surface area and changing the crystallinity of the substrate. The advantages of ultrasonic methods, among others, can not be heard, are direct and easily focused. Pretreatment is aided by the addition of NaOH to break the chemical bond between lignin and cellulose. Characterization of samples using Spectrophotometer-UV for lignin and HPLC for cellulose and hemicellulose. SEM testing is done to look at the microscopic structure of OPEFB before and after sonication. The parameters used in this study are time (10, 30, 60 minutes), amplitude (30, 60, 90%) and solvent concentration (0.5; 1; 1.5M). From various variations, obtained the best variation (high cellulose but low energy consumption) at 10 minutes, 90% amplitude and 0.5 M NaOH with cellulose, hemicellulose and lignin content of 44.156%, 23.978% and 26.801% with consumption energy of 54375 joules.

***Keywords**: Bioethanol, oil palm empty fruit bunch, opefb, ultrasonic, lignocellulose, amplitude*